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Biological invasions and endosymbiosis in Arthropods, a case study: *Bemisia tabaci*

Helene Delatte[1], Nathalie Becker[2], Magalie Thierry[3], Jean-Michel Lett[4], Reynaud Bernard[5]
[1]CIRAD, Reunion, [2]MNHN, Reunion, [3]CIRAD, Reunion, [4]CIRAD, Reunion, [5]CIRAD, France

Biological invasions are more and more frequent worldwide and understanding this process is a big issue. Invasive success depends on several traits permitting local adaptation. Among those traits, host-plant adaptations or demographic advantages are specific traits involving in some cases endosymbiosis. Intracellular prokaryotic association known as endosymbiosis is a well known-phenomenon which is present at least in 15% of all insects. Among the sap-sucking insects of the suborder Sternorrhyncha, psyllids, whiteflies, aphids, and mealybugs, an obligatory endosymbiont is even crucial to allow them to synthesise essential amino acids. Furthermore, other non obligatory endosymbionts, so-called secondary endosymbionts, are known to be linked to adaptive traits which can enhance invasiveness of their host. These biotic interactions will be discussed through several models and in particular the invasive whitefly Bemisia tabaci. Indeed, two biotypes (B and Q) or “genetic species” of B. tabaci have a tremendous invasive success worldwide since the 80ies. They harbor a wide range of endosymbionts, with potentially 6 secondary endosymbionts (according to biotypes): Cardinium, Arsenophonus, Hamiltonella, Rickettsia, Wolbachia and Fritschea and one obligatory Portiera aleyrodidarum. Recent studies showed significant links between reproductive manipulations (strong female bias, non random hybridization), large fitness benefits, better thermotolerance or transmission efficiency of begomoviruses according to the endosymbionts of their infected hosts. Most of the functions of those secondary endosymbionts are described in other models, and are largely unknown yet in B. tabaci.

Keywords:*invasion, bemisia tabaci*

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